



PATENT
0649-0772P

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant: Takashi YAMAGUCHI et al. Conf.: 6901
Appl. No.: 09/773,752 Group: 1714
Filed: February 2, 2001 Examiner: YOON, T.
For: MOLDING COMPOSITION

DECLARATION UNDER 37 CFR § 1.132

Assistant Commissioner for Patents
Washington, DC 20231

I, Kuniyasu Kawabe, declare and state

- 1) I am a graduate of Kyoto University and I received my degree in the year 1982.
- 2) I have been employed by Kao Corporation for 19 years as a synthetic chemist in the fields of toner resins (at Wakayama Laboratory from 1983 to 1999) and the polyester applications at the Chemical Laboratory from 1999 to the present.
- 3) I am familiar with the Advisory Action dated September 6, 2002 and the Office Action dated December 19, 2002.
- 4) I am one of the inventors of the above-identified application.
- 5) The following comparative experiments were done by me or directly under my control.

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6) Preparation of the Closest Prior Art in Hefner '178 (US Patent No. 4,524,178)

The preparation was performed as described in Hefner '178 for formulation 2 at column 13, lines 7-8 in 4,524,178. Synthesis was carried out as appears in column 12 in Hefner '178. In particular, an orthophthalic polyester was prepared as follows: Maleic anhydride (970.8 grams, 9.90 moles) and phthalic anhydride (977.7 grams, 6.60 moles) were added to a reactor and heated to a white-colored stirred slurry maintained at 100°C under a nitrogen atmosphere. Propylene glycol (1381.2 grams, 18.15 moles) was added and a maximum exotherm of 140 °C resulted fifty-five minutes later. At that time, a steam condenser was started, and the temperature controller was set at 160 °C. That temperature was achieved forty-five minutes later. After two hours, the temperature controller was set at 205°C and that temperature was achieved ninety-five minutes later. After 8.0 hours at the 205 °C reaction temperature, a total of 245 milliliters of water layer had accumulated in a Dean Stark trap. The reactor was cooled to 165 °C and 100 ppm of hydroquinone was added. The unsaturated polyester alkyd was recovered as a clear, transparent solid having an acid value of 28.1, a hydroxyl value of 43.1, a softening point of 58.5 °C and Tg of 22.2 °C.

Portions of the foregoing alkyd were mixed with styrene in the amounts given in preparation 2 in the table at the top of column

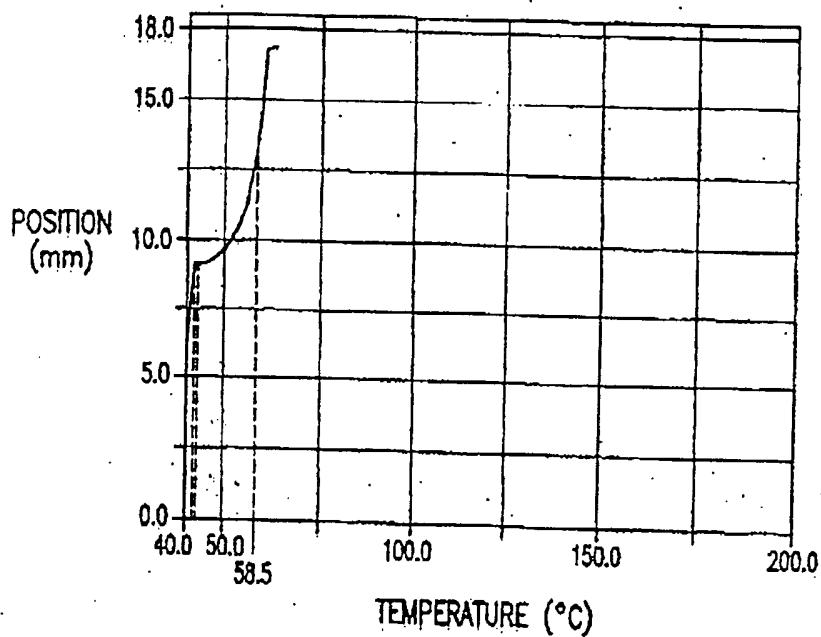
13 in Hefner '178. Softening points were measured in the same manner as described in the instant written description.

Evaluation was made by blending together the synthesized polyester and styrene but in the absence of VRP. The polyester was pulverized until it was on the order of a few millimeters and styrene was blended in the ratio as shown in the below Table. Various levels of styrene were tested (even levels below that listed in Hefner '178) to ascertain the smell problem. The mix of polyester and styrene was agitated in a ball mill for five hours.

Polyester/styrene (weight ratio)	Solubility regarding polyester	Viscosity (cp)	Smell
61.3/38.7	soluble	315	Strong
80/20	insoluble	-	Strong
90/10	insoluble	-	Strong
95/5	insoluble	-	Strong

Results

The polyester of Hefner '178 had a low softening point that was unexpectedly below the softening point of the instant invention. The following table and measurement chart illustrates the data for the polyester tested in Hefner '178. The graph illustrates the softening point of the polyester.



No.	Temperature (°C)	Flow Rate (cm ³ /s)	Shear Rate (s ⁻¹)	Viscosity (Pa, s)	Position (mm)
1	40.0	.01630	166.0	2954	6.02
2	43.0	.0005700	6.825	71850	9.12
3	46.0	.0005857	5.965	82200	9.24
4	49.0	.0011243	12.66	38740	9.50
5	52.0	.002210	22.51	21780	9.99
6	55.0	.003962	40.36	12150	10.85
7	58.0	.008511	86.69	5658	12.57
8	61.0	.01081	110.0	4453	16.46
9	64.0				16.86

7) The softening point of the polyester in Hefner '178 is unexpectedly inferior to the softening point in the instant invention.

8) Moreover, the polyester and styrene of Hefner '178 possessed a smell that was not present in any of the Examples in the instant invention.

I hereby declare all statements made herein of my own knowledge are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment or both under 18 USC §1001, and that such willful false statements may jeopardize the validity of the application or any patent that issues therefrom.

February 13, 2003
dated

Kuniyasu Kawabe
signature